European Journal of Oncology Nursing 35 (2018) 47–53

Contents lists available at ScienceDirect

European Journal of Oncology Nursing

journal homepage: www.elsevier.com/locate/ejon

Sexual distress and sexual function in a sample of Iranian women with gynecologic cancers

Mohammad Ali Soleimani[a], Nasim Bahrami[a,*], Ameneh Yaghoobzadeh[b], Averil Parker[c], Yiong Huak Chan[d]

[a] Social Determinants of Health Research Center, Qazvin University of Medical Sciences, Qazvin, Iran
[b] School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran
[c] Concordia University, Psychology Department, 7141 Sherbrooke Street West, Montreal, Quebec, H4B 1R6, Canada
[d] Biostatistics Unit, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

ARTICLE INFO

Keywords:
Female Sexual Dysfunction
Female Sexual Function Index
Women
Cancer

ABSTRACT

Purpose: This study aims to examine the correlation between sexual function and sexual distress, and to determine the predictive factors of sexual function and sexual distress in women with gynecologic cancers.
Methods: In this cross-sectional study, 387 subjects were referred to Velayat Hospital in Qazvin, Iran, using convenience sampling method between June and August 2016. Data were collected using a demographic questionnaire, the Female Sexual Function Index (FSFI), and the Female Sexual Distress Scale-Revised (FSDS-R).
Results: Mean scores of sexual function and sexual distress were 19.4 ± 6.7 and 29.2 ± 12.9, respectively. There was no significant correlation between sexual function and sexual distress. Multivariate predictors of FSFI were cancer stage ($p = 0.023$), cancer type ($p = 0.025$), duration of disease ($\beta = -0.10$, 95% CI [-0.17, – 0.02], $p = 0.017$) and social support ($\beta = 0.53$, 95% CI [0.24, 0.83], $p < 0.001$). Predictors of FSDS-R were economic status ($p = 0.040$) and type of cancer ($p = 0.016$). There was a negative relation between the overall score on FSDS-R and FSFI sub domains of desire ($\beta = -1.4$, $p = 0.033$) and arousal ($\beta = -2.1$, $p = 0.024$).
Conclusions: This study did not support a relation between sexual function and sexual distress. Other factors, however, including cancer type, economic status and social support may affect sexual function and sexual distress. Future studies needed to determine further factors which can affect the sexual distress and sexual function of gynecologic cancer patients.

1. Introduction

Cancer is a major public health problem worldwide and is the second leading cause of death in the United States (Siegel et al., 2016). In Iran, cancer is one of the most common diseases in the 21st century and is the third most common cause of death, after cardiovascular disease and accidents (Saadat et al., 2015). The prevalence of cancer, especially cancers specific to women, is growing worldwide. Approximately 13 percent of women around the world are diagnosed with various types of gynecologic cancers (Zhou et al., 2015).

Receiving any cancer diagnosis is an unpleasant experience, wrought with distress, which impacts a person's personal and family life (Soleimani et al., 2017). As a result of diagnosis, patients experience socio-economic problems, marital issues, and psychological problems (Brunault et al., 2016; Wilson et al., 2016). Intense psychological distress is common not only upon receiving a diagnosis, but also throughout treatment (Stafford and Miller, 2014). Patients experience anger, depression, pain, and suffering as a result of the gynecologic cancer. Physical consequences of cancer, such as impaired body image, hair loss, and removal of female sex organs, as well as psychological consequences of cancer, such as death anxiety, can affect sexuality (Benedict et al., 2016a; Hasanvand et al., 2015).

Changes in sexual function is a common complication of gynecologic cancer and related treatments (Hopkins et al., 2015). For example, a systematic review in 2016 shows that Female Sexual Dysfunction (FSD) prevalence was higher than 60% at all cancer sites, with the highest value for gynecological cancer. In addition, women with cancer showed low FSFI scores with a high prevalence of FSD (Maiorino et al., 2016). In women, sexual function is divided into six components including 1) the desire to engage in sexual activity 2) sexual arousal (i.e. physiological responses as a result of stimulation of sexual organs) 3) lubrication following sexual stimulation 4) orgasm 5) sexual

* Corresponding author.
E-mail addresses: ma.soleimany@qums.ac.ir (M.A. Soleimani), nbahrami@qums.ac.ir (N. Bahrami), a.yaghoobzadeh@yahoo.com (A. Yaghoobzadeh), averilcathleen.parker@mail.concordia.ca (A. Parker), yiong_huak_chan@nuhs.edu.sg (Y.H. Chan).

https://doi.org/10.1016/j.ejon.2018.05.007
Received 24 November 2017; Received in revised form 6 April 2018; Accepted 14 May 2018

satisfaction and 6) pain (i.e. frequency and amount of vaginal pain during intercourse; (Rosen et al., 2000). Women with ovarian cancer experience a reduction in estrogen and androgens, resulting in vaginal dryness, thinning of the vagina and vulva tissues, loss of vaginal elasticity, and hot flashes (Michael and O'Keane, 2000). In addition, a persistent lack of sexual interest and lubrication has been reported in this population (Carter et al., 2005; Jensen et al., 2003). Aside from the cancer itself, treatment also has an impact on sexual function. Women with gynecologic cancer who received radiotherapy had more problems with sexual desire and arousal compared to those who received another treatment (Stage, 1989). In another study, researchers found that patients who underwent a radical hysterectomy experienced severe orgasmic problems and uncomfortable sexual intercourse due to reduced vaginal size, severe dyspareunia, and sexual dissatisfaction (Jensen et al., 2004). Thus, sexual function in patients with gynecological cancer is impaired.

Sexual distress is a broad term encompassing any sexual discomfort and dysfunction and includes decreased libido, difficulty achieving orgasm, dyspareunia, vaginal dryness, and vaginismus. In fact, sexual distress can cause stress and anxiety in individuals (Kadkhodaian et al., 2015). Researchers have found that sexual distress is present in all stages of treatment and during follow up in patients with gynecologic cancer (Kadkhodaian et al., 2015; Oskay et al., 2011; Pinto, 2013; Plotti et al., 2012). Despite this, sexual distress is undertreated in patients with gynecological cancer (Plotti et al., 2012). Few researchers have investigated the factors underlying sexual distress in these patients (Colson et al., 2006; Hawton et al., 1994; Maughan and Clarke, 2001). An exception is a study by (Pazmany et al., 2013), who showed that cognitions about one's own vaginal penetration, body image and genital self-image each contributed independently to the variance in sexual distress in Premenopausal women.

From the few studies investigating factors that contribute to sexual distress, we see that patients with gynecological cancer experience physical, mental and economic changes, which all contribute to sexual distress (Fernandes, 2009; Raggio et al., 2014; Tojal and Costa., 2015). These changes can lead to sexual dissatisfaction not only in patients, but in their spouses as well (Woertman and van den Brink, 2012; Ye et al., 2014). Sexual dissatisfaction has a direct impact on the quality of life of patients, and it reduces the quality of their sexual relationships (Fahami et al., 2014). Impaired sexual function is also a factor that contributes to sexual distress in women with gynecologic cancer(Plotti et al., 2012).

Sexual distress also impacts the mental health of the patient (Michael and O'Keane, 2000; Pinto, 2013). In fact, sexual distress may lead to anger and aggression, separation, divorce, depression and other mental health problems (Mazinani et al., 2013). The negative effects on patients' mental health in turn impacts the relationship between spouses, which in turn can negatively impact sexual satisfaction and can lead to sexual dysfunction (Lau et al., 2006). Health care providers, however, pay more attention to the survival of the patient, controlling the signs and symptoms of disease and physical symptoms of patients, and do not often address the mental health of patients (Javadi et al., 2010; Paterson et al., 2015).

Although extensive research has substantiated that patients with cancer report lowered sexual satisfaction and sexual function, and high psychological distress (Benedict et al., 2016b; Wettergren et al., 2017), there has been limited research investigating sexual distress and sexual function among patients with gynecologic cancer (Stafford and Miller, 2014). Further, although factors such as age, sex, socioeconomic status, and health have been shown to impact sexual function and the experience of distress (Jackson et al., 2016; Rottmann et al., 2017), little is known about relations of these factors to sexual function and distress in women with cancer specifically (Fahami et al., 2014). Even less in known about factors associated with sexual function and sexual distress among Iranian patients with gynecologic cancer, who are a part of a culture dominated by Islamic religious and social practices. The purpose of this exploratory study was to examine the relations between sexual distress and sexual function among Iranian patients with gynecologic cancer who are receiving or preparing for anticancer treatment. Further, we examined if sociodemographic factors (age, education, and socioeconomic status), health factors (cancer stage, type of cancer, type of treatment received, and time lapse since diagnosis), were associated with sexual distress and sexual function in this sample of Iranian women with gynecologic cancer.

2. Methods

2.1. Study design and participants

A descriptive cross-sectional correlational design was used to examine the relationship between sexual distress and sexual function. A convenience sampling approach was adopted to collect the data of gynecologic cancer patients who were referred to the oncology clinic of Velayat Hospital in Qazvin, Iran, between June and August 2016. To determine adequate sample size, we chose the Cohen approach (Cohen, 1988; Cohen et al., 2003). The Cohen approach evaluates both the relative and absolute values of the changes between groups and allows statistical analyses. The sample size necessary was 387, with an $\alpha = 0.05$, power = 0.80 ($\beta = 0.20$), and effect size ($d = 0.3$). During the above-mentioned time period, 506 patients were referred to the study. Of these patients, 468 patients fulfilled inclusion criteria, and 387 patients were recruited with an overall survey response rate of 82.6%.

In order to be eligible to participate in this study, participants had to 1) have a confirmation of a gynecologic cancer and it's stage, 2) be between the ages of 20–65, 3) be aware of the disease, and 4) have the ability to communicate with researcher. The experience of any sexual distress before being diagnosed the cancer was considered an exclusion criteria.

2.2. Instruments

Participants completed a questionnaire which consisted of three parts: 1) Basic questions regarding demographics, 2) the Female Sexual Function Index (FSFI) and 3) the Female Sexual Distress Scale-Revised (FSDR). The demographic portion of the questionnaire collected information about each patients' age, age at marriage, length of marriage, duration of marriage, educational level, economic status, number of children, duration of the disease, stage of the cancer based on pathologist report, and type of treatment. Social support was measured by an analogue scale ranging from 0 to 10 (0 = no social support to 10 = sufficient/adequate/lots of social support).

2.2.1. Female Sexual Distress Scale-Revised (FSDS-R)

This is a self-report questionnaire designed by Derogatis et al. (2008). It consists of 13 items assessing different aspects of sexual activity-related distress in women. All items are scored on a five-point Likert-type scale ranging from 0 (never) to 4 (always), with a higher score indicating more sexual distress (Derogatis et al., 2008). The validity and the reliability of FSDS-R have been well established in Iranian population (Azimi Nekoo et al., 2014; Ghassami et al., 2014). In our sample, Cronbach's alpha for the FSDS-R was 0.86 indicating good internal consistency.

2.2.2. Female Sexual Function Index (FSFI)

This questionnaire was designed by Rosen et al. (2000). It consists of 19 items that cover 6 domains of women's sexual functioning including sexual desire (items 1, 2), arousal (items 3,4,5,6), lubrication (items 7,8,9,10), orgasm (items 11,12,13), satisfaction (items 14,15,16), and pain (items 17,18,19). All items are scored on a Likert-type scale ranging from 0 (or 1) to 5, with higher scores indicating better sexual functioning (Rosen et al., 2000). The validity and the reliability of FSFI have been previously well established (Hasanzadeh

Mofrad et al., 2015; Karamidehkordi and Roudsari, 2014). In this sample, Cronbach's alpha for FSFI was 0.82.

2.3. Ethical considerations

Our study was approved by our main affiliated university's medical sciences ethics committee (No. Ir.QUMS.REC.1394.296). Before signing an informed consent form, patients were informed about study aims and procedures, that participation was voluntary, and that participation would not affect medical care. Patient confidentiality was assured by completing all study procedures in a quiet treatment area. To ensure that a broad cross-section of patients were allowed to participate, a trained research assistant provided support as needed. All personal data was de-identified with the use of assigned codes.

2.4. Statistical analysis

The Statistical Package for Social Sciences, version 20.0 (SPSS Inc., Chicago, IL, USA) was utilized for data analysis. Descriptive statistics for continuous variables were means and standard deviations, and were *n* (%) for the categorical variables. For the assessment of normality of two main variables (sexual function and sexual distress), we used the Kolmogorov-Smirnov (K-S) and Shapiro-Wilk test, with p-value greater than 0.05, which indicates normal distribution of data. A Pearson correlation analysis was applied to examine the relation between FSFI and FDS-R. The predictors associated with FSFI and FDS-R scores were determined using general linear models with Bonferroni corrections for pairwise comparisons. Statistical significance was set at $p < 0.05$ for all procedures.

3. Results

3.1. Participants' profile

Table 1 describes the demographic profiles of the respondents. Participants were an average of 43.6 years old ($SD = 8.4$, range = 30–61) and 34.6% (n = 134) of the patients were in the first stage of cancer. The respondents predominately suffered from breast cancer (n = 162, 41.9%) and 22% (n = 85) of patients received a combination of therapies.

3.2. Correlational analysis

The mean score for the FSFI was 19.4 ($SD = 6.7$; range = 2–31.6). This score reflects low levels of sexual function among the patients with gynecologic cancer. The mean total score for the sexual distress was 29.2 ($SD = 12.9$; range = 0.0–52.0) which indicated low levels. There were no significant Pearson correlations between FSDS-R total and FSFI total scores, nor between FSDS-R and any of the FSFI sub scales (Table 2).

3.3. Predictors of Sexual Function (using the FSFI)

Multivariate predictors of FSFI were cancer stage, cancer type, duration of disease & social support. Subjects with cancer stage IV ($p = 0.023$) and having multiple types of cancer (breast/cervical & breast/ovarian; ($p = 0.025$) displayed the lowest FSFI. We found a negative relation between duration of disease and FSFI score ($\beta = -0.10$, 95% CI [-0.17, – 0.02], $p = 0.017$) and a positive relation between social support and FSFI score ($\beta = 0.53$, 95% CI [0.24, 0.83], $p < 0.001$) and a trend positive relation ($p = 0.063$) between type of treatment Chemo & Radiation and FSFI score (see Table 3).

3.4. Predictors of Sexual Distress (using the FSDS-R)

Multivariate predictors for FSDS-R were economic status, cancer type, and the desire and arousal subscales of the FSFI. Patients with good/very good economic status had higher FSDS-R scores compared to the patients with poor and average economic status ($p = 0.040$). Patients with breast/cervical and breast/ovarian cancers had lower FSDS-R scores compared to patients with a single cancer ($p = 0.016$). We found negative relations between FSDS-R scores and the FSFI subscales for desire ($\beta = -1.4$, 95% CI [-0.26, −0.12], $p = 0.033$) and for arousal ($\beta = -2.1$, 95% CI -3.9 to −0.28, $p = 0.024$) (see Table 4).

Table 1
Demographic characteristics of the Married study participants (n = 387).

Demographic characteristics		Number (%)
Educational status	No formal education	44 (11.4)
	Primary	65 (16.8)
	Intermediate	94 (24.3)
	High School	96 (24.8)
	Collegiate	88 (22.7)
Economic Status	Poor	114 (29.5)
	Average	156 (40.3)
	Good	95 (24.5)
	Very Good	22 (5.7)
Stage of Cancer	I	134 (34.6)
	II	138 (35.7)
	III	83 (21.4)
	IV	32 (8.3)
Type of Cancer	Breast	162 (41.9)
	Ovary	67 (17.3)
	Uterus	150 (38.8)
	Breast and Cervical Cancer	5 (1.3)
	Breast and Ovarian Cancer	3 (0.8)
Type of treatment	Treatment undecided or not started	6 (1.6)
	Chemo therapy	70 (18.1)
	Radiation therapy	13 (3.4)
	Combination (Chemo and Radiation) therapies	85 (22.0)
	Surgery	2 (0.5)
	Multiple treatment	211 (54.5)
		Mean (SD), range
Age	years	43.6 (8.4), 30-61
Marriage age		19.4 (5.4), 9-42
length of marriage	months	23.9 (10.9), 2-52
Number of children		2.9 (2.1), 0-12
Time Duration of disease	months	14.3 (9.2), 1-48
Social Support		4.1 (2.3), 0-10
FSFI	Total score of FSFI	19.4 (6.7), 2–31.6
Desire	Subscale of FSFI	3.1 (1.2), 1.2–6.0
Arousal	Subscale of FSFI	3.1 (1.3), 0.0–5.1
Lubrication	Subscale of FSFI	3.1 (1.3), 0.0–6.0
Orgasm	Subscale of FSFI	3.2 (1.4), 0.0–6.0
Satisfaction	Subscale of FSFI	3.5 (1.6), 0.8–6.0
Pain	Subscale of FSFI	3.4 (1.7), 0.0–6.0
FSDS-R	Total score of FDS-R	29.2 (12.9), 0.0–52.0

Table 2
Correlation between FSFI and FSD-R.

	Spearman's Correlations with FSD-R
Desire	0.007 ($p = 0.885$)
Arousal	−0.106 ($p = 0.370$)
Lubrication	0.012 ($p = 0.821$)
Orgasm	0.083 ($p = 0.101$)
Satisfaction	0.082 ($p = 0.105$)
Pain	−0.046 ($p = 0.367$)
FSFI	0.023 ($p = 0.648$)

Table 3
Predictors of Sexual Function (using the FSFI).

Demographic characteristics		FSFI Mean (SD)	Unadjusted p-value	Adjusted p-value
Educational status	No formal education	16.4 (8.2)	0.002	0.389
	Primary	18.0 (7.5)		
	Intermediate	20.4 (5.2)		
	High School	20.4 (5.5)		
	Collegiate	19.9 (7.1)		
Economic Status	Poor	17.5 (7.2)	0.001	0.118
	Average	19.6 (6.6)		
	Good	20.6 (5.8)		
	Very Good	22.5 (5.4)		
Stage of Cancer	I	20.8 (5.8)	0.002	0.023
	II	19.0 (6.6)		
	III	19.3 (6.7)		
	IV	15.9 (8.7)		
Type of Cancer	Breast	19.4 (6.8)	0.005	0.025
	Ovary	19.5 (6.2)		
	Uterus	19.9 (6.3)		
	Breast and Cervical Cancer	13.8 (11.2)		
	Breast and Ovarian Cancer	7.0 (8.7)		
Type of treatment	Treatment undecided or not started	19.8 (8.8)	0.111	0.063
	Chemo therapy	19.6 (6.5)		
	Radiation therapy	19.7 (5.9)		
	Combination (Chemo and Radiation) therapies	21.2 (4.9)		
	Surgery	16.5 (19.6)		
	Multiple treatment	18.7 (7.1)		
			b (95% CI)	**b (95% CI)**
Age	Age of subject	–	−0.13 (−0.21 to – 0.06) p = 0.001	−0.03 (−0.26 to 0.21) p = 0.828
Marriage age	Age of Marriage	–	0.08 (−0.04 to 0.20) p = 0.197	−0.03 (−0.26 to 0.20) p = 0.759
length of marriage	Duration of Marriage	–	−0.10 (−0.16 to – 0.04) p = 0.001	−0.03 (−0.29 to 0.18) p = 0.793
Number of children	Number of Participants' Children	–	−0.50 (−0.82 to – 0.18) p = 0.002	−0.21 (−0.59 to 0.29) p = 0.291
Time Duration of disease	Duration of the Disease	–	−0.12 (−0.20 to – 0.05) p = 0.001	−0.10 (−0.17 to – 0.02) p = 0.017
Social Support	**Social Support of subjects**	–	0.70 (0.42–0.98) p < 0.001	0.53 (0.24–0.83) p < 0.001
FSDS.R	Total Score	–	0.02 (−0.03 to 0.07) p = 0.451	−0.02 (−0.08 to 0.03) p = 0.371

Abbreviation: SD: standard deviation; b: regression estimate; CI: Confidence Interval.

4. Discussion

This study was conducted in order to examine the relation between sexual distress and sexual function, and the factors predicting these two constructs, in Iranian patients with gynecologic cancer. We did not find any significant relation between sexual distress and sexual function or the subscales of sexual distress. This is in contrast with previous findings. For example, Fritzer et al. (2013) reported a positive relationship between these variables in endometriosis patients (Fritzer et al., 2013). Bjerggaard et al. (2015) have also studied sexual distress and sexual function among peoples with Type 2 Diabetes and reported a positive correlation between these variables (Bjerggaard et al., 2015). Moreover, the results of one study indicated that high sexual distress is accompanied by experiencing low sexual function among middle-aged women (Dennerstein et al., 2008). It seems that individuals with impaired sexual function are more likely to have difficulty preserving, restoring or improving their sexual well-being (Rosato et al., 2014). Focusing on other values, for example children or family, may distract patients and draw their attention away from their sex-related problems. This can be considered as the possible reason of not finding relations.

Our study revealed a negative relation between cancer stage and sexual function score. A study investigating women with cervical cancer and a history of pelvic radiation therapy in Iran supports these finding (Hasanzadeh Mofrad et al., 2015), while another study in breast cancer survivors and healthy women did not find a significant correlation among these variables (HY et al., 2009). In another study, women's sexual satisfaction, capacity for orgasm, and frequency of masturbation remained stable after cancer therapy whereas frequency of sexual activity with a partner and range of sexual practices decreased significantly after one year (Stage, 1989). These results show that the patients with more advanced stages of cancer will experience more problems in their sexual relationships. Patients with cancer experience emotional disturbances such as loss of femininity, loss of physical attractiveness, among others (Begovic-Juhant et al., 2012; Spiegel and Nemeroff, 1997). These feelings affect patients physically, psychologically and socially in a vicious circle. Most patients with gynecologic cancer are of childbearing age, and may have concerns and distress related to loss of fertility, which affects sexual function (Reis et al., 2010; Sacerdoti et al., 2010). Cancer also influences a patient's subsequent experiences in all aspects of life, especially her sexual life. Therefore, sexual function will be impaired over time (Khajehaminian et al., 2014).

The current study also indicates that patients with concurrent breast/cervical or breast/ovarian cancer report the lowest FSFI scores. In the case of simultaneous gynecological cancers, problems are multiplied. Treatment of one of the cancers impacts the performance of other female organs. For example, patients with breast cancer have problems with body image (Fobair et al., 2006). When a patient concurrently has cervical cancer, she will experience problems on the genital tract which can directly affect the sexual function (Jensen et al.,

Table 4
Predictors of sexual distress (using the FSDS-R).

Demographic characteristics		FDSR Mean (SD)	Unadjusted p-value	Adjusted p-value
Educational status	No formal education	24.7 (13.8)	0.001	0.437
	Primary	28.8 (12.4)		
	Intermediate	27.9 (12.6)		
	High School	28.4 (12.4)		
	Collegiate	33.9 (12.4)		
Economic status	Poor	25.9 (12.8)	< 0.001	0.040
	Average	28.6 (13.1)		
	Good	33.5 (11.4)		
	Very Good	31.8 (14.7)		
Stage of cancer	I	31.2 (13.14)	0.058	0.429
	II	28.8 (13.12)		
	III	26.4 (11.46)		
	IV	29.7 (14.50)		
Type of cancer	Breast	27.6 (12.4)	0.005	0.016
	Ovary	27.8 (14.1)		
	Uterus	32.0 (12.5)		
	Breast and Cervical Cancer	19.6 (8.1)		
	Breast and Ovarian Cancer	20.1 (3.1)		
Type of treatment	Treatment undecided or not started	31.5 (14.9)	0.221	0.344
	Chemo therapy	30.2 (12.9)		
	Radiation therapy	25.8 (14.4)		
	Combination (Chemo and Radiation) therapies	31.6 (13.0)		
	Surgery	35.0 (7.1)		
	Multiple treatment	27.9 (12.6)		
			b (95% CI)	**b (95% CI)**
Age	Age of subject	–	−0.27 (−0.42 to – 0.12) p = 0.001	−0.33 (−0.79 to – 0.13) p = 0.156
Marriage age	Age of Marriage	–	0.23 (−0.01 to 0.46) p = 0.058	0.22 (−0.22 to 0.65) p = 0.334
length of marriage	Duration of Marriage	–	−0.19 (−0.31 to – 0.07) p = 0.002	0.28 (−0.23 to – 0.78) p = 0.281
Number of children	Number of Participants' Children	–	−0.86 (−1.5 to – 0.24) p = 0.007	−0.23 (−1.0 to 0.53) p = 0.548
Time Duration of disease	Duration of the Disease	–	−0.11 (−0.25 to 0.03) p = 0.109	−0.04 (−0.20 to 0.12) p = 0.596
Social Support	**Social Support of subjects**	–	0.42 (−0.15 to 0.98) p = 0.145	0.22 (−0.38 to 0.83) p = 0.470
FSFI	Total Score	–	0.07 (−0.12 to 0.27) p = 0.451	−0.09 (−0.30 to 0.11) p = 0.371 Adjusted for above demo variables
Desire	Subscale of FSFI	–	0.04 (−1.0 to 1.1) p = 0.943	−1.4 (−0.26 to −0.12) p = 0.033
Arousal	Subscale of FSFI	–	−0.11 (−1.1 to 0.9) p = 0.830	−2.1 (−3.9 to −0.28) p = 0.024
Lubrication			0.35 (−0.63 to 1.3) p = 0.482	0.60 (−1.9 to 3.1) p = 0.638
Orgasm	Subscale of FSFI	–	0.78 (−0.15 to 1.7) p = 0.101	1.1 (−1.5 to 3.7) p = 0.429
Satisfaction	Subscale of FSFI	–	0.71 (−0.08 to 1.5) p = 0.077	0.15 (−1.3 to 1.6) p = 0.841
Pain	Subscale of FSFI	–	−0.20 (−0.97 to 0.56) p = 0.600	0.18 (−1.0 to 1.4) p = 0.770

2003). The results of Bergmark et al. (1999) revealed that vaginal changes due to cervical cancer and treatments would affect sexual function at least as much as the loss of a breast. An obvious reason for the predominant interest in the breast is that, in developed countries, breast cancer is more common than cancer of the female genital organs (Bergmark et al., 1999).

The current study also found that duration of cancer had a negative relation with FSFI scores. This is in contrast to findings by Lui et al. (2015), who found that duration of the illness was not a significant predictor of sexual dysfunction among Filipinas with breast cancer (Lui et al.). Diagnosis of cancer can be very distressing to some patients because they may experience direct or indirect sexual side effects of treatment such as disturbances of arousal, dyspareunia, vaginal stenosis, among others. Patients may worry that sexual intercourse will further injure their diseased sexual organ, or lead to cancer recurrance, as long as the survival period is not over (Tee et al., 2014).

The findings of the present study also emphasized that FSFI has a positive relationship with social support. Pieterse et al. (2013) and Milbury et al. (2013) supported these finding (Milbury et al., 2013; Pieterse et al., 2013). However, Tee et al. (2014) did not find a significant relation between these variables (Tee et al., 2014). Social support is defined as support provided by family members, colleagues and other friends (Tasdan and Yalcin, 2010). Those who receive social support feel that others love them, and have a sense of importance. They feel that others respect them, and they know they are a part of family and friend network or social organization, which can be the source of monetary and moral help (Alizadeh et al., 2016). Therefore, having support services may facilitate dealing with the problems related to having cancer. For example, connecting with friends and others can help patients to share their concerns and experiences with others,

especially with peers. These resources can act as a buffer and reduce the patient's distress.

The current study also found that type of treatment (chemo and radiation therapies) had a correlation with FSFI scores. Similar to our results, previous studies indicated that patients with gynecologic and breast cancers who had chemo and radiation therapy reported higher FSFI (Fahami et al., 2014; Hendren et al., 2005). However, other researchers found conflicting results (Capogrosso et al., 2016; Dickson et al., 2015). It seems that treatments such as radiotherapy and chemotherapy in gynecologic cancer causes damages to the genital system and the organs around it. Vaginal stenosis, reduction in vaginal lubrication, and lack of orgasm are among the effects of radiotherapy and chemotherapy which may influence the sexual function (Fahami et al., 2014).

Other important study findings include that women with good/very good economic status showed a higher FSDS-R score. Colson et al. (2006) showed that socio-economic status is one of the factors that is related to FSDS-R scores (Colson et al., 2006). In contrast, another study on middle-aged women revealed that there was a weak positive correlation between higher socioeconomic status and sexual enjoyment of sexual activity (Hawton et al., 1994). A study by Ansong et al. (2000) on men reported that erectile dysfunction was more common in persons who have poor/very poor economic status (Ansong et al., 2000). In our study, it seems that the cost of cancer diagnosis and treatment for subjects who have good economic status is challenging and can be a reason for concern for these people especially if patients don't have adequate insurance coverage.

Suffering from multiple cancers was another factor that predicted FSDS-R scores. Specifically, women with breast/cervical and breast/ovarian cancer reported lower FSDS-R compared to who had only one type of cancer. Maybe women with one type of cancer are also at an earlier stage of cancer (and have had relatively less time to process their emotions) and women with multiple cancers are at a later stage (and have had time to come to terms with their diagnosis). In addition, maybe the women with multiple cancers are on stronger medications, which reduces their distress compared to women with only one type of cancer. Some studies showed that patients with gynecologic disease, including cancer, are vulnerable to sexual distress (Maughan and Clarke, 2001). Cancer diagnosis and the related stress can have a deep effect on sexual function. This is especially the case for women with breast cancer who lose their femininity. Impaired self-concept relating to sexuality in both gynecologic and breast cancer will influence on the severity of sexual function and experience of sexual distress (Fahami et al., 2014; Lindau et al., 2015).

The desire and arousal subscales of FSFI were negatively associated with the FSDS-R. Studies on Caucasian women with healthy populations and cancer patients show similar results (Brotto et al., 2008; Brotto and Heiman, 2007; Stephenson et al., 2012; Stephenson and Meston, 2012). Impairments in sexual desire and arousal can impact woman's sexual experiences in a number of ways including, but not limited to, decreasing her physical pleasure during sex, preventing or disrupting sexual activity, and engendering negative partner responses during sex. These consequences of impaired sexual function are likely highly distressing to the individual in many cases, possibly even more so than the impaired functioning itself (Stephenson and Meston, 2012).

4.1. Limitations

Some of the major limitations of our study were the cross sectional design of the study and convenience sampling procedure, which limits the generalizability of the research findings. Although our sample size is adequate according to a power calculation, a larger number of women are needed to increase the information about the sexual function and sexual distress in groups of women with different cancers. When interpreting our results, the sample size should be considered, with studies with larger sample insignificant difference may become statistically significant. Another weak point was the lack of data about frequency of sexual intercourse, fantasies, masturbation and quality of sexual relationship. Moreover, the sample was taken from a heterogeneous group of patients with different stages and treatments for cancer at varying points in the illness trajectory. Finally, one of the limitations of self-report in general is that there is always the potential that social desirability will contribute to how participants answered questions.

5. Conclusion

This study did not support the relation between sexual distress and sexual function among a sample of Iranian women with gynecologic cancer. However, the results showed that sexual function and sexual distress are related to many elements including cancer type, economic status and level of social support received. Future studies need to clearly determine the exact relation between FSFI and FSDS-R in specific types of cancer, and to uncover other unknown factors affecting the sexual distress and sexual function of women with gynecological cancer.

Acknowledgments

The authors would like to express their gratitude to the patients participated in this study. This project was funded by Qazvin University of Medical Sciences, Qazvin, Iran (P.D. 222).

References

Alizadeh, Z., Pasandideh, M.M., Nezhad, M.R.N., 2016. The study of personality characteristics, self-esteem and social support in men and women committing illicit sexual relationship. Int. J. Humanit. Cult. Stud (IJHCS) 1427–1437 ISSN 2356-5926 1.

Ansong, K.S., Lewis, C., Jenkins, P., Bell, J., 2000. Epidemiology of erectile dysfunction: a community-based study in rural New York State. Ann. Epidemiol. 10, 293–296.

Azimi Nekoo, E., Burri, A., Ashrafti, F., Fridlund, B., Koenig, H.G., Derogatis, L.R., Pakpour, A.H., 2014. Psychometric properties of the Iranian version of the female sexual distress scale-revised in women. J. Sex. Med. 11, 995–1004.

Begovic-Juhant, A., Chmielewski, A., Iwuagwu, S., Chapman, L.A., 2012. Impact of body image on depression and quality of life among women with breast cancer. J. Psychosoc. Oncol. 30, 446–460.

Benedict, C., Philip, E.J., Baser, R.E., Carter, J., Schuler, T.A., Jandorf, L., DuHamel, K., Nelson, C., 2016a. Body image and sexual function in women after treatment for anal and rectal cancer. Psycho Oncol. 25, 316–323.

Benedict, C., Rodriguez, V.M., Carter, J., Temple, L., Nelson, C., DuHamel, K., 2016b. Investigation of body image as a mediator of the effects of bowel and GI symptoms on psychological distress in female survivors of rectal and anal cancer. Support. Care Cancer 24, 1795–1802.

Bergmark, K., Åvall-Lundqvist, E., Dickman, P.W., Henningsohn, L., Steineck, G., 1999. Vaginal changes and sexuality in women with a history of cervical cancer. N. Engl. J. Med. 340, 1383–1389.

Bjerggaard, M., Charles, M., Kristensen, E., Lauritzen, T., Sandbaek, A., Giraldi, A., 2015. Prevalence of sexual concerns and sexual dysfunction among sexually active and inactive men and women with screen-detected type 2 diabetes. Sex. Med. 3, 302–310.

Brotto, L.A., Basson, R., Luria, M., 2008. A mindfulness-based group psychoeducational intervention targeting sexual arousal disorder in women. J. Sex. Med. 5, 1646–1659.

Brotto, L.A., Heiman, J.R., 2007. Mindfulness in sex therapy: applications for women with sexual difficulties following gynecologic cancer. Sex. Relatsh. Ther. 22, 3–11.

Brunault, P., Champagne, A.L., Huguet, G., Suzanne, I., Senon, J.L., Body, G., Rusch, E., Magnin, G., Voyer, M., Réveillère, C., 2016. Major depressive disorder, personality disorders, and coping strategies are independent risk factors for lower quality of life in non-metastatic breast cancer patients. Psycho Oncol. 25, 513–520.

Capogrosso, P., Boeri, L., Ferrari, M., Ventimiglia, E., La Croce, G., Capitanio, U., Briganti, A., Damiano, R., Montorsi, F., Salonia, A., 2016. Long-term recovery of normal sexual function in testicular cancer survivors. Asian J. Androl. 18, 85–89.

Carter, J., Rowland, K., Chi, D., Brown, C., Abu-Rustum, N., Castiel, M., Barakat, R., 2005. Gynecologic cancer treatment and the impact of cancer-related infertility. Gynecol. Oncol. 97, 90–95.

Cohen, J., 1988. Statistical Power Analysis for the Behavioral Sciences, 2 ed. Lawrence Erlbaum Associates, Publishers, New Jersey, USA.

Cohen, J., Cohen, P., West, S.G., Aiken, L.S., 2003. Applied Multiple Regression/correlation Analysis for the Behavioral Sciences, 3 ed. Lawrence Erlbaum. Routledge, Mahwah, New Jersey.

Colson, M.H., Lemaire, A., Pinton, P., Hamidi, K., Klein, P., 2006. Sexual behaviors and mental perception, satisfaction and expectations of sex life in men and women in France. J. Sex. Med. 3, 121–131.

Dennerstein, L., Guthrie, J.R., Hayes, R.D., DeRogatis, L.R., Lehert, P., 2008. Sexual function, dysfunction, and sexual distress in a prospective, population-based sample

of mid-aged, Australian-born women. J. Sex. Med. 5, 2291–2299.
Derogatis, L., Clayton, A., Lewis-D'Agostino, D., Wunderlich, G., Fu, Y., 2008. Validation of the female sexual distress scale-revised for assessing distress in women with hypoactive sexual desire disorder. J. Sex. Med. 5, 357–364.
Dickson, E.L., Hubbs, J.L., Vogel, R.I., Rivard, C.L., Teoh, D.G.K., Geller, M.A., 2015. What women want: sexual quality of life after the treatment of gynecologic cancer. In: ASCO Annual Meeting Proceedings, pp. e20617.
Fahami, F., Savabi, M., Mohamadirizi, S., Shirani, N., 2014. Relationship between sexual dysfunction and treatment modality in patients with gynecologic and breast cancers. Iran. J. Obstet. Gynecol. Infertil. 17, 15–22.
Fernandes, S., 2009. Psychosocial Predictors of Adjustment to the Disease and Treatment in Women with Breast Cancer: the Role of the Emotional State of the Representations of the Disease, Optimism and Perceived Benefits [Portugal]. University of Minho, Portugal.
Fobair, P., Stewart, S.L., Chang, S., D'Onofrio, C., Banks, P.J., Bloom, J.R., 2006. Body image and sexual problems in young women with breast cancer. Psycho Oncol. 15, 579–594.
Fritzer, N., Haas, D., Oppelt, P., Hornung, D., Wölfler, M., Ulrich, U., Fischerlehner, G., Sillem, M., Hudelist, G., 2013. More than just bad sex: sexual dysfunction and distress in patients with endometriosis. Eur. J. Obstet. Gynecol. Reprod. Biol. 169, 392–396.
Ghassami, M., Asghari, A., Shaeeri, M.R., Soltaninejad, Z., Safarinejad, M.R., 2014. Psychometric properties of the female sexual distress scale-revised among a sample of non-clinical Iranian women. Int. J. Psychiatr. Clin. Pract. 18, 293–299.
Hasanvand, S., Ashktorab, T., Jafari, Z., Salmani, N., Safariyan, Z., 2015. Cancer-related fatigue and its association with health-related quality of. J. Shahid Beheshti Sch. Nurs. Midwifery 24.
Hasanzadeh Mofrad, M., Karami Dehkordi, A., Mozaffar Tizabi, N., Amirian, M., 2015. Survey of sexual dysfunction in women with cervical cancer and a history of pelvic radiation therapy in 2009 to 2013 in Ghaem and Omid hospitals, Mashhad. Iran. J. Obstet. Gynecol. Infertil. 18, 9–18.
Hawton, K., Gath, D., Day, A., 1994. Sexual function in a community sample of middle-aged women with partners: effects of age, marital, socioeconomic, psychiatric, gynecological, and menopausal factors. Arch. Sex. Behav. 23, 375–395.
Hendren, S.K., O'Connor, B.I., Liu, M., Asano, T., Cohen, Z., Swallow, C.J., MacRae, H.M., Gryfe, R., McLeod, R.S., 2005. Prevalence of male and female sexual dysfunction is high following surgery for rectal cancer. Ann. Surg. 242, 212–223.
Hopkins, T., Stavraka, C., Gabra, H., Fallowfield, L., Hood, C., Blagden, S., 2015. Sexual activity and functioning in ovarian cancer survivors: an internet-based evaluation. Climacteric 18, 94–98.
HY, K., HS, S., MJ, C., 2009. Sexual function of breast cancer survivors and healthy women : a comparative study. J Korean Oncol Nurs 9, 60–66.
Jackson, S.E., Wardle, J., Steptoe, A., Fisher, A., 2016. Sexuality after a cancer diagnosis: a population-based study. Cancer 122, 3883–3891.
Javadi, M., Asgari, H., Yaghoobbi, M., Tavazohi, H., 2010. Self-assessment of the non-communicable disease surveillance system in Medical University of Isfahan based on the model suggested by the World Health Organization. J. Sch. Publ. Health Inst. Publ. Health Res. 8, 47–60.
Jensen, P.T., Groenvold, M., Klee, M.C., Thranov, I., Petersen, M.A., Machin, D., 2003. Longitudinal study of sexual function and vaginal changes after radiotherapy for cervical cancer. Int. J. Radiat. Oncol. Biol. Phys. 56, 937–949.
Jensen, P.T., Groenvold, M., Klee, M.C., Thranov, I., Petersen, M.A., Machin, D., 2004. Early-stage cervical carcinoma, radical hysterectomy, and sexual function. A longitudinal study. Cancer 100, 97–106.
Kadkhodaian, S., Hasanzade Mofrad, M., Saghafi, N., Mokhber, N., Rafaati, M., 2015. Evaluation of sexual dysfunction in women with ovarian cancer admitted to Ghaem and Omid hospitals in Mashhad. J. Obstet. Gynecol. Infertil. Iran 18, 1–7.
Karamidehkordi, A., Roudsari, R.L., 2014. Body image and its relationship with sexual function and marital adjustment in infertile women. Iran. J. Nurs. Midwifery Res. 19, 51–58.
Khajehaminian, F., Ebrahimi, M., Kamali, M., Dolatshahi, B., Younesi, S.J., 2014. Sexual functioning after mastectomy surgery- A qualitative study. Iran. J. Breast Dis. 7, 50–58.
Lau, J., Cheng, Y., Wang, Q., Yang, X., 2006. Prevalence and correlates of sexual dysfunction among young adult married women in rural China: a population-based study. Int. J. Impot. Res. 18, 89–97.
Lindau, S.T., Abramsohn, E.M., Matthews, A.C., 2015. A manifesto on the preservation of sexual function in women and girls with cancer. Am. J. Obstet. Gynecol. 213, 166–174.
Lui, A.G.A., Balbuena, J.M.L., Faltado Jr., A.L., Uy, C.V.O., Strebel, H.M.J.S., 2015. Sexual dysfunction among Filipino breast cancer patients. Acta Med. Philipp. 49, 77–80.
Maiorino, M.I., Chiodini, P., Bellastella, G., Giugliano, D., Esposito, K., 2016. Sexual dysfunction in women with cancer: a systematic review with meta-analysis of studies using the Female Sexual Function Index. Endocrine 54, 329–341.
Maughan, K., Clarke, C., 2001. The effect of a clinical nurse specialist in gynaecological oncology on quality of life and sexuality. J. Clin. Nurs. 10, 221–229.
Mazinani, R., Akbari, M., Kaskian, A., Kashanian, M., 2013. Evaluation of Prevalence of sexual dysfunctions and its related factors in women. Razi J. Med. Sci. 19, 59–66.
Michael, A., O'Keane, V., 2000. Sexual dysfunction in depression. Hum. Psychopharmacol. 15, 337–345.
Milbury, K., Cohen, L., Jenkins, R., Skibber, J.M., Schover, L.R., 2013. The association between psychosocial and medical factors with long-term sexual dysfunction after treatment for colorectal cancer. Support. Care Cancer 21, 793–802.
Oskay, Ü.Y., Beji, N.K., Bal, M.D., Yılmaz, S.D., 2011. Evaluation of sexual function in patients with gynecologic cancer and evidence-based nursing interventions. Sex. Disabil. 29, 33–41.
Paterson, C., Lengacher, C., Donovan, K., Kip, K., Tofthagen, C., 2015. The Effects of MBSR (BC) on Sexual Distress and Body Image Disturbance in Breast Cancer Survivors, Psycho-oncology. WILEY-BLACKWELL, pp. 287 HOBOKEN 07030-5774, NJ USA.
Pazmany, E., Bergeron, S., Van Oudenhove, L., Verhaeghe, J., Enzlin, P., 2013. Aspects of sexual self-schema in premenopausal women with dyspareunia: associations with pain, sexual function, and sexual distress. J. Sex. Med. 10, 2255–2264.
Pieterse, Q.D., Kenter, G.G., Maas, C.P., de Kroon, C.D., Creutzberg, C.L., Trimbos, J.B.M., Ter Kuile, M.M., 2013. Self-reported sexual, bowel and bladder function in cervical cancer patients following different treatment modalities: longitudinal prospective cohort study. Int. J. Gynecol. Cancer 23, 1717–1725.
Pinto, A.C., 2013. Sexuality and breast cancer: prime time for young patients. J. Thorac. Dis. 5, S81–S86.
Plotti, F., Nelaj, E., Sansone, M., Antonelli, E., Altavilla, T., Angioli, R., Benedetti Panici, P., 2012. Sexual function after modified radical hysterectomy (Piver II/Type B) vs. classic radical hysterectomy (Piver III/Type C2) for early stage cervical cancer. A prospective study. J. Sex. Med. 9, 909–917.
Raggio, G., Butryn, M., Arigo, D., Mikorski, R., Palmer, S., 2014. Prevalence and correlates of sexual morbidity in long-term breast cancer survivors. Psychol. Health 29, 632–650.
Reis, N., Beji, N.K., Coskun, A., 2010. Quality of life and sexual functioning in gynecological cancer patients: results from quantitative and qualitative data. Eur. J. Oncol. Nurs. 14, 137–146.
Rosato, E., Rossi, C., Molinaro, I., Di Giulio, M.A., Trombetta, A.C., Marra, A.M., Gigante, A., Barbano, B., Quarta, S., Pisarri, S., Afeltra, A., Salsano, F., 2014. Sexual distress, sexual dysfunction and relationship quality in women with systemic sclerosis: correlation with clinical variables. Int. J. Immunopathol. Pharmacol. 27, 279–285.
Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., Ferguson, D., D'Agostino Jr., R., 2000. The Female Sexual Function Index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. J. Sex Marital Ther. 26, 191–208.
Rottmann, N., Gilså Hansen, D., dePont Christensen, R., Hagedoorn, M., Frisch, M., Nicolaisen, A., Kroman, N., Flyger, H., Johansen, C., 2017. Satisfaction with sex life in sexually active heterosexual couples dealing with breast cancer: a nationwide longitudinal study. Acta Oncol. 56, 212–219.
Saadat, S., Yousefifard, M., Asady, H., Jafari, A.M., Fayaz, M., Hosseini, M., 2015. The most important causes of death in Iranian population; a Retrospective Cohort Study. Emergency 3, 16.
Sacerdoti, R.C., Lagana, L., Koopman, C., 2010. Altered sexuality and body image after gynecological cancer treatment: how can psychologists help? Prof. Psychol. Res. Pract. 41, 533–540.
Siegel, R.L., Miller, K.D., Jemal, A., 2016. Cancer statistics, 2016. CA Cancer J. Clin. 66, 7–30.
Soleimani, M.A., Lehto, R.H., Negarandeh, R., Bahrami, N., Chan, Y.H., 2017. Death anxiety and quality of life in Iranian caregivers of patients with cancer. Cancer Nurs. 40, E1–E10.
Spiegel, D., Nemeroff, C.B., 1997. Psychosocial aspects of breast cancer treatment. In: Seminars in Oncology-supplements. Grune & Stratton, [New York], pp. 36–47.
Stafford, L., Miller, B., 2014. Should Every Woman with Gynecologic Cancer Undergo Routine Screening for Psychological Distress and Sexual Dysfunction?, Controversies in the Management of Gynecological Cancers. Springer, pp. 297–308.
Stage, I., 1989. Sexual dysfunction and treatment for early stage cervical cancer. Cancer 63, 204–212.
Stephenson, K.R., Hughan, C.P., Meston, C.M., 2012. Childhood sexual abuse moderates the association between sexual functioning and sexual distress in women. Child Abuse Neglect 36, 180–189.
Stephenson, K.R., Meston, C.M., 2012. Consequences of impaired female sexual functioning: individual differences and associations with sexual distress. Sex. Relatsh. Ther. 27, 344–357.
Tasdan, M., Yalcin, T., 2010. Relationship between primary school teachers' perceived social support and organizational trust level. Educ. Sci. Theor. Pract. 10, 2609–2620.
Tee, B., Rasidi, A., Rushdan, M., Ismail, A., Sidi, H., 2014. The prevalence and risk factors of sexual dysfunction in gynaecological cancer patients. Med. Health 9, 53–61.
Tojal, C., Costa, R., 2015. Depressive symptoms and mental adjustment in women with breast cancer. Psycho Oncol. 24, 1060–1065.
Wettergren, L., Kent, E.E., Mitchell, S.A., Zebrack, B., Lynch, C.F., Rubenstein, M.B., Keegan, T.H., Wu, X.C., Parsons, H.M., Smith, A.W., 2017. Cancer negatively impacts on sexual function in adolescents and young adults: the AYA Hope study. Psycho Oncol. 26, 1632–1639.
Wilson, K.G., Dalgleish, T.L., Chochinov, H.M., Chary, S., Gagnon, P.R., Macmillan, K., De Luca, M., O'shea, F., Kuhl, D., Fainsinger, R.L., 2016. Mental disorders and the desire for death in patients receiving palliative care for cancer. BMJ Support. Palliat. Care 6, 170–177.
Woertman, L., van den Brink, F., 2012. Body image and female sexual functioning and behavior: a review. J. Sex. Res. 49, 184–211.
Ye, S., Yang, J., Cao, D., Lang, J., Shen, K., 2014. A systematic review of quality of life and sexual function of patients with cervical cancer after treatment. Int. J. Gynecol. Cancer 24, 1146–1157.
Zhou, E.S., Falk, S.J., Bober, S.L., 2015. Managing premature menopause and sexual dysfunction. Curr. Opin. Support. Palliat. Care 9, 294–300.